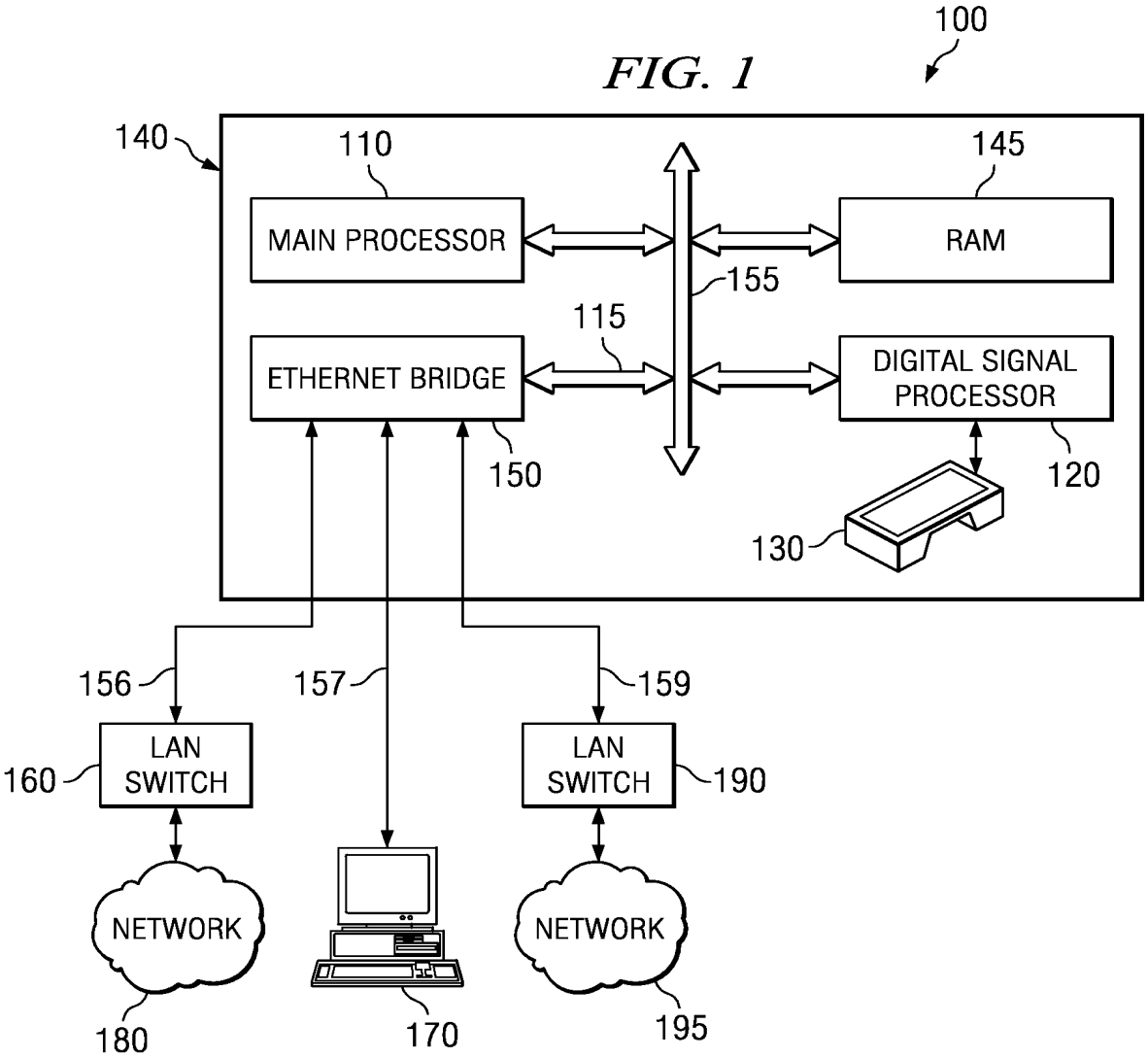
FIG. 1


100
140
110
145
MAIN PROCESSOR
RAM
155
115
ETHERNET BRIDGE
DIGITAL SIGNAL PROCESSOR
150
120
130
156
157
159
160
LAN SWITCH
LAN SWITCH
190
NETWORK
NETWORK
180
170
195

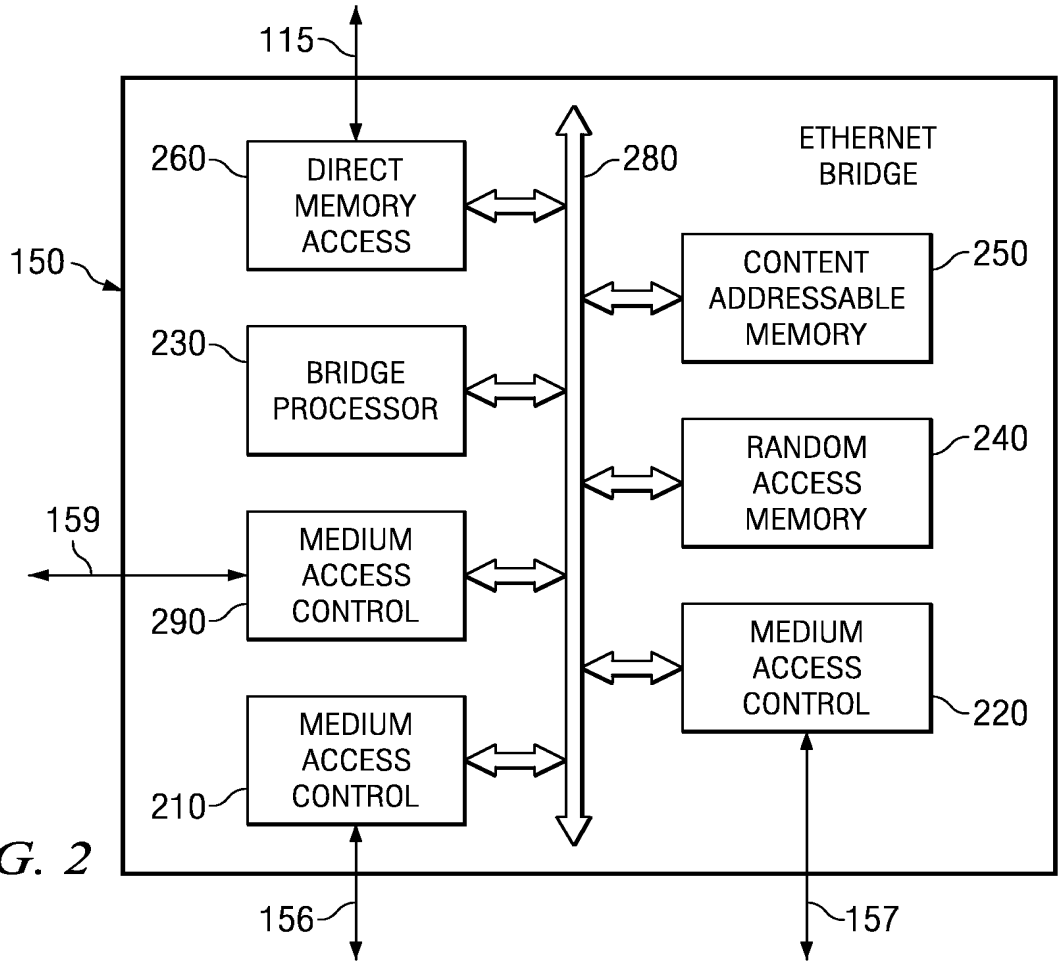


FIG. 2

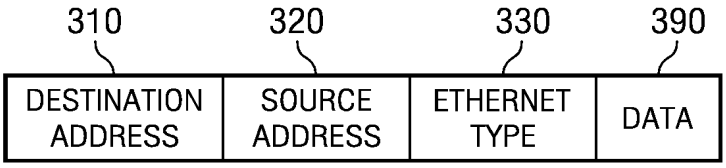


FIG. 3A
(PRIOR ART)

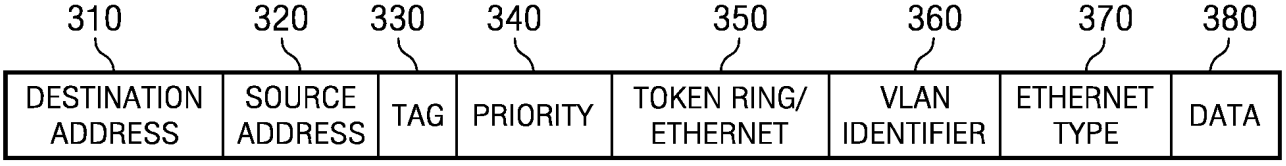


FIG. 3B
(PRIOR ART)

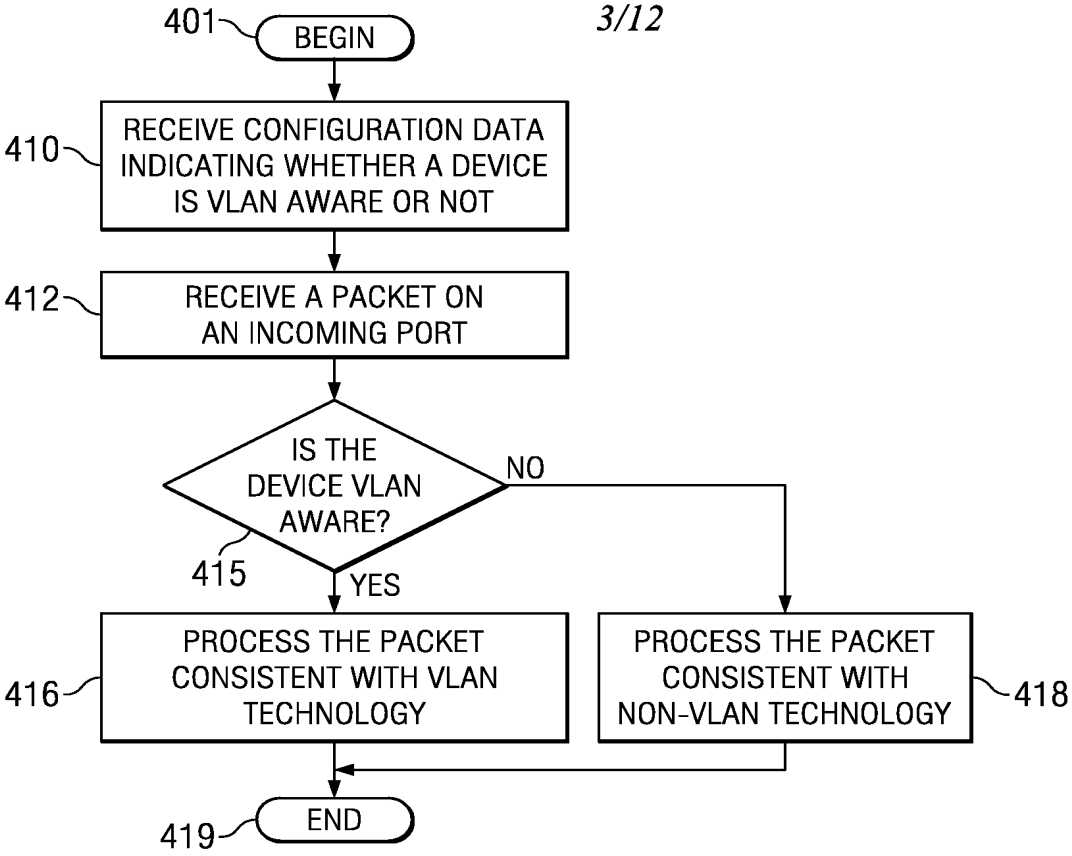

401
BEGIN
410
RECEIVE CONFIGURATION DATA INDICATING WHETHER A DEVICE IS VLAN AWARE OR NOT
412
RECEIVE A PACKET ON AN INCOMING PORT
IS THE DEVICE VLAN AWARE?
NO
YES
415
416
PROCESS THE PACKET CONSISTENT WITH VLAN TECHNOLOGY
PROCESS THE PACKET CONSISTENT WITH NON-VLAN TECHNOLOGY
418
419
END

FIG. 4A

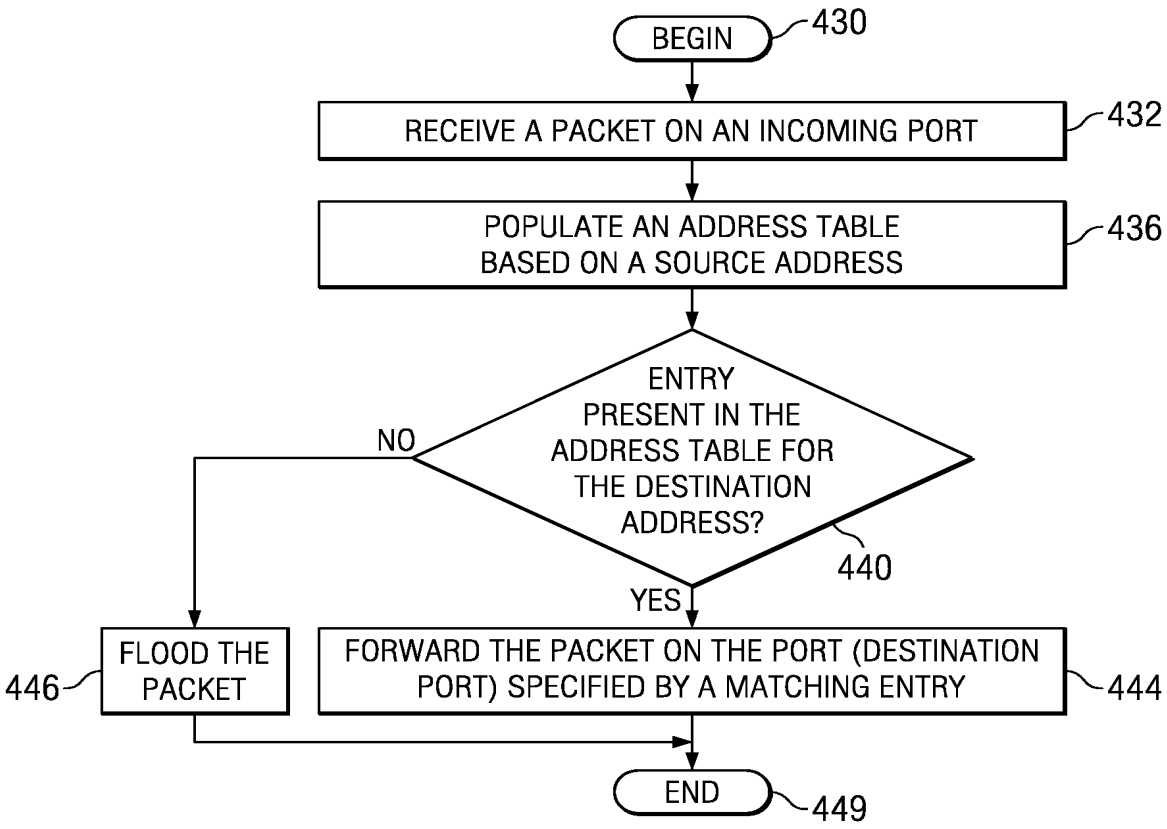

BEGIN
430
RECEIVE A PACKET ON AN INCOMING PORT
432
POPULATE AN ADDRESS TABLE BASED ON A SOURCE ADDRESS
436
ENTRY PRESENT IN THE ADDRESS TABLE FOR THE DESTINATION ADDRESS?
NO
YES
440
FLOOD THE PACKET
446
FORWARD THE PACKET ON THE PORT (DESTINATION PORT) SPECIFIED BY A MATCHING ENTRY
444
END
449

FIG. 4B

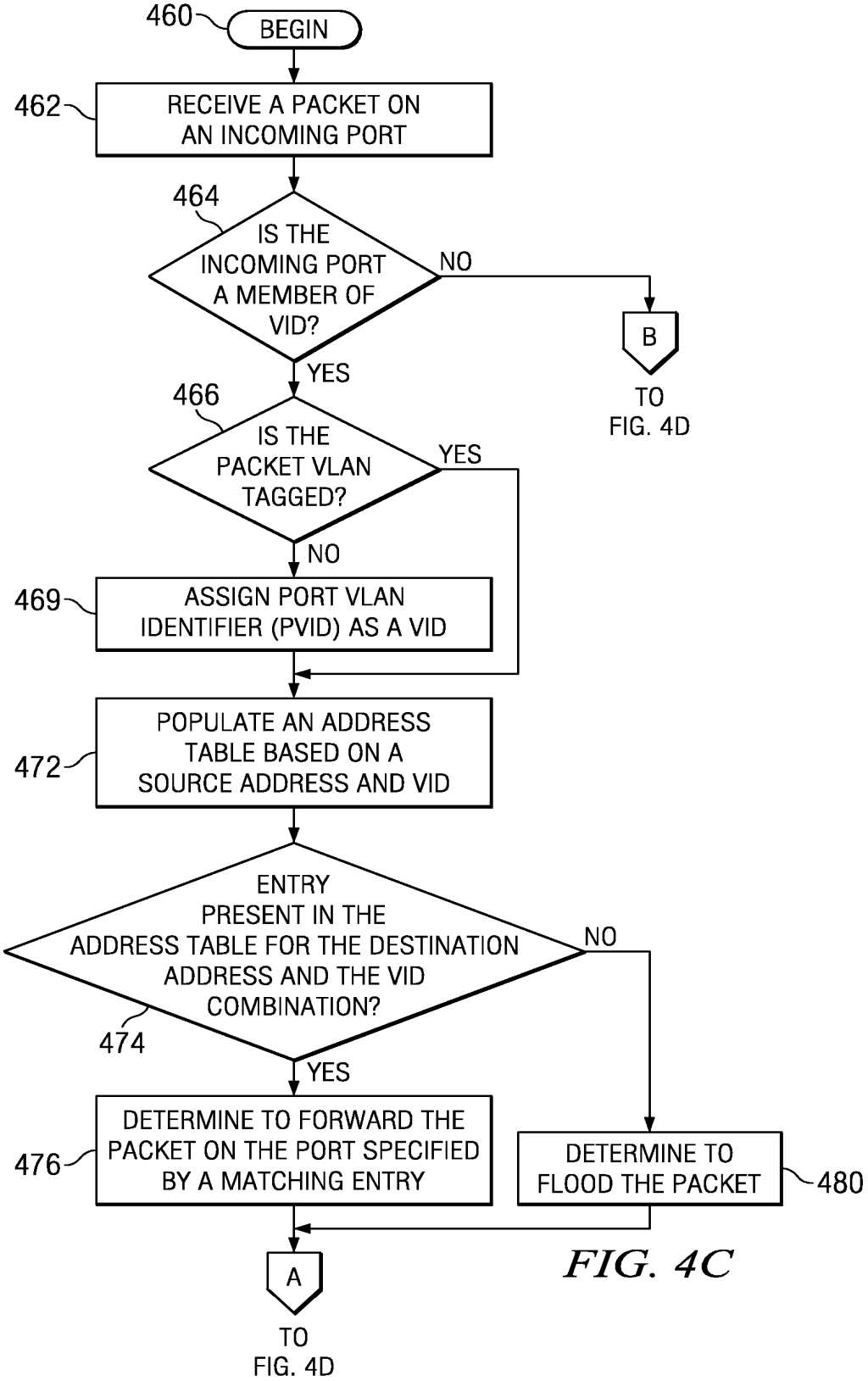

460
BEGIN
462
RECEIVE A PACKET ON AN INCOMING PORT
464
IS THE INCOMING PORT A MEMBER OF VID?
NO
B
TO FIG. 4D
YES
466
IS THE PACKET VLAN TAGGED?
YES
NO
469
ASSIGN PORT VLAN IDENTIFIER (PVID) AS A VID
472
POPULATE AN ADDRESS TABLE BASED ON A SOURCE ADDRESS AND VID
ENTRY PRESENT IN THE ADDRESS TABLE FOR THE DESTINATION ADDRESS AND THE VID COMBINATION?
474
NO
YES
476
DETERMINE TO FORWARD THE PACKET ON THE PORT SPECIFIED BY A MATCHING ENTRY
DETERMINE TO FLOOD THE PACKET
480
A
TO FIG. 4D

FIG. 4C

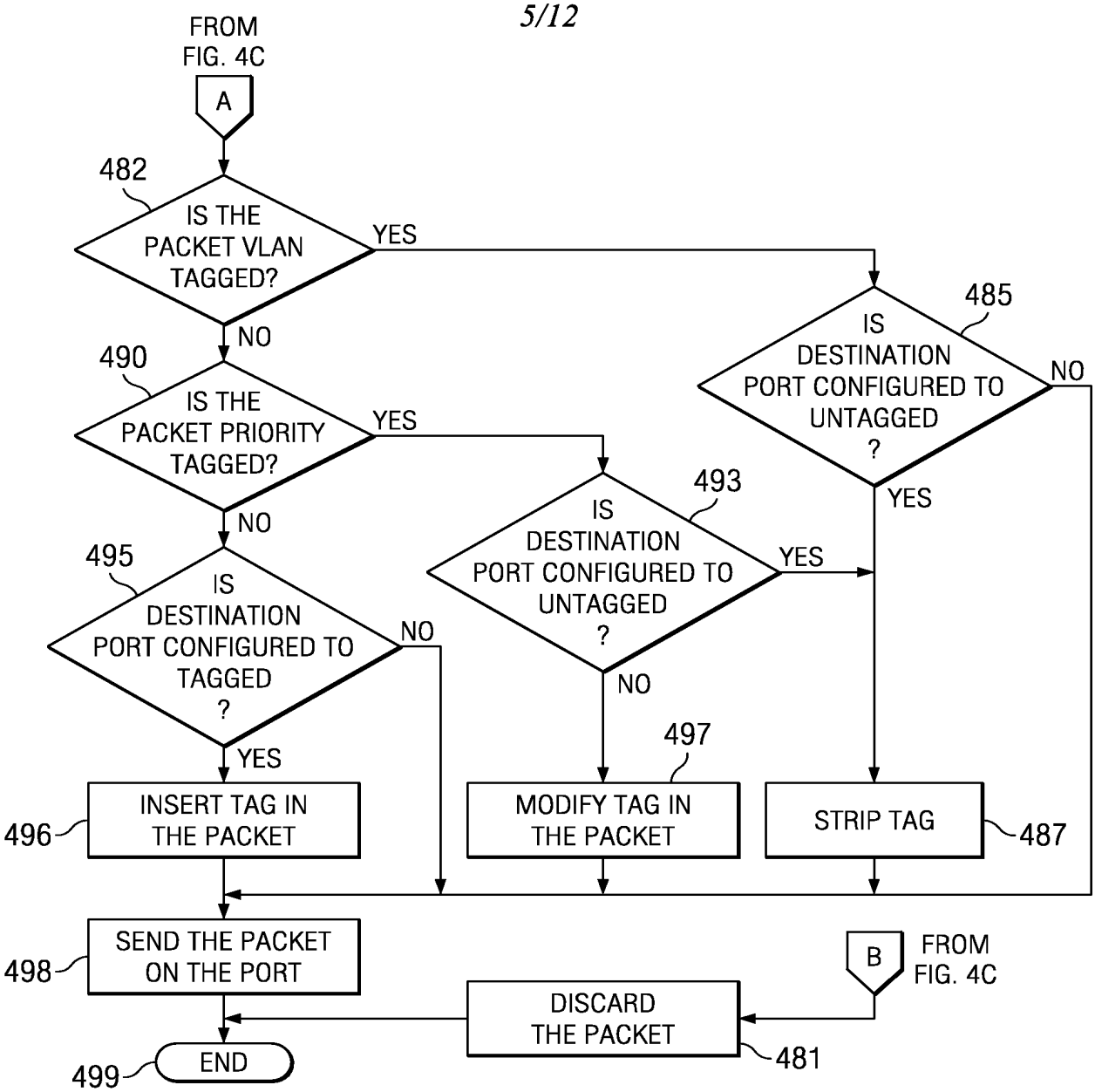


FIG. 4D

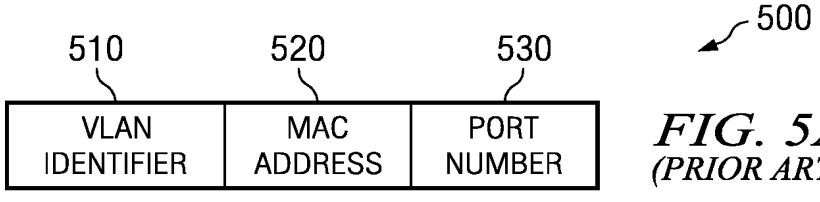


FIG. 5A
(PRIOR ART)

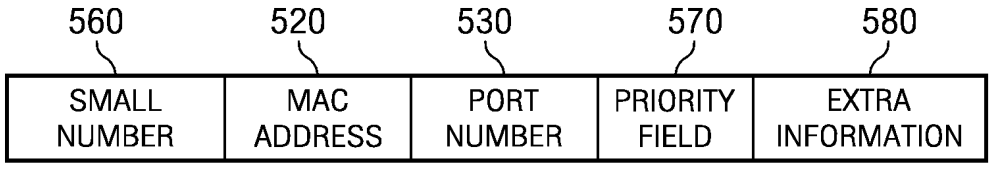


FIG. 5B

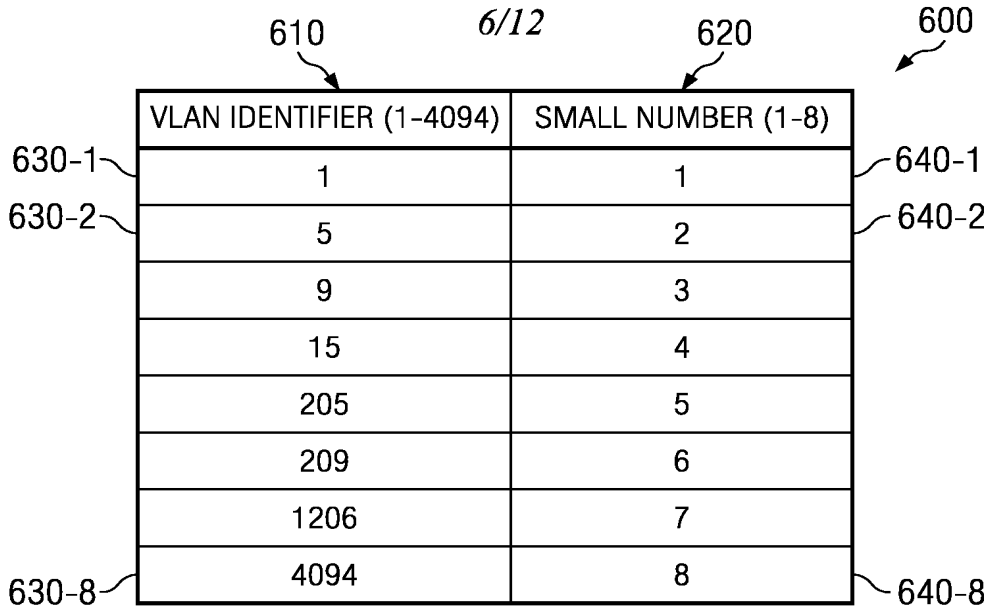

610
620
600
VLAN IDENTIFIER (1-4094)
SMALL NUMBER (1-8)
630-1
630-2
630-8
640-1
640-2
640-8
1
1
5
2
9
3
15
4
205
5
209
6
1206
7
4094
8

FIG. 6

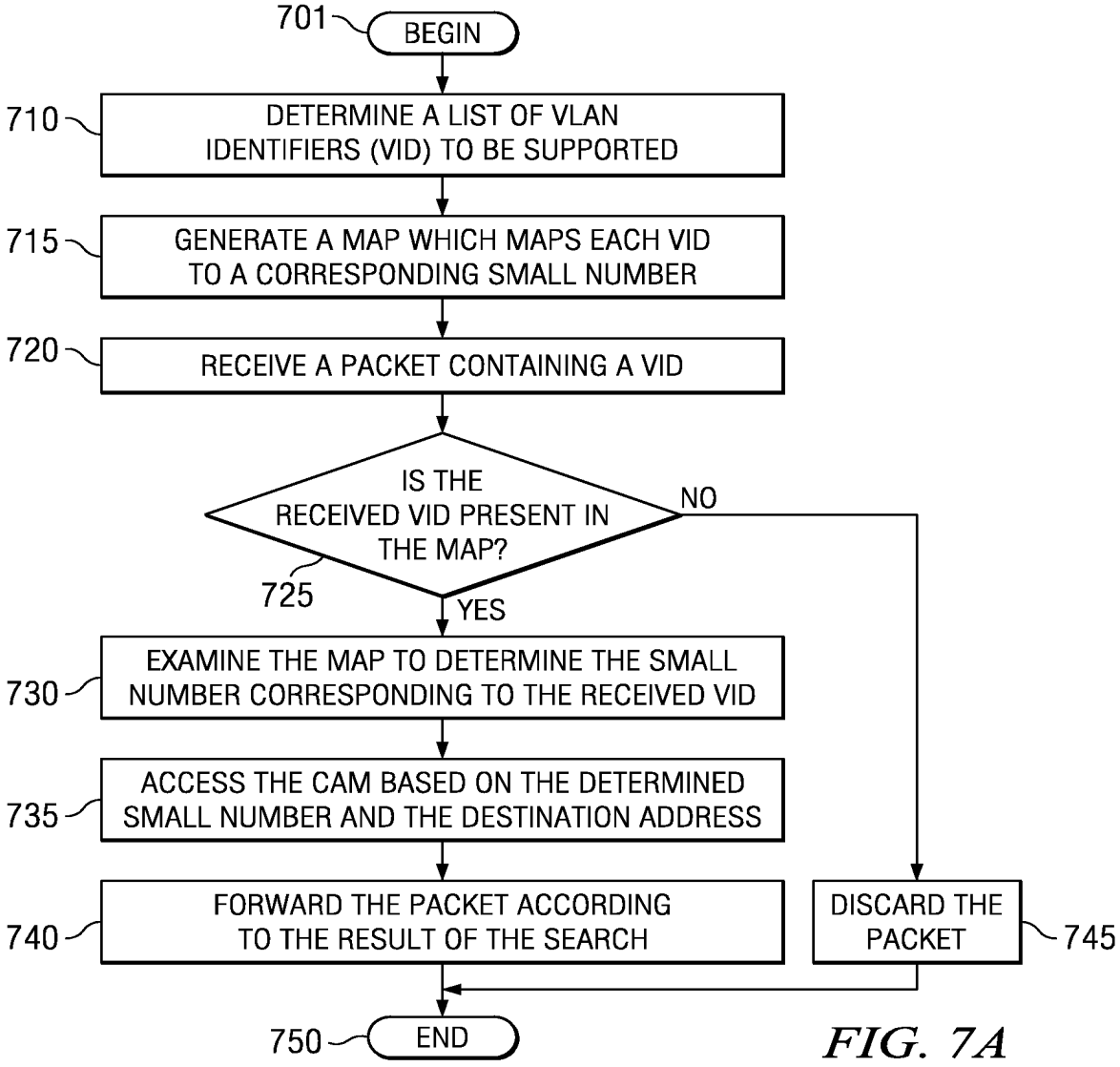

701
BEGIN
710
DETERMINE A LIST OF VLAN IDENTIFIERS (VID) TO BE SUPPORTED
715
GENERATE A MAP WHICH MAPS EACH VID TO A CORRESPONDING SMALL NUMBER
720
RECEIVE A PACKET CONTAINING A VID
IS THE RECEIVED VID PRESENT IN THE MAP?
725
NO
YES
730
EXAMINE THE MAP TO DETERMINE THE SMALL NUMBER CORRESPONDING TO THE RECEIVED VID
735
ACCESS THE CAM BASED ON THE DETERMINED SMALL NUMBER AND THE DESTINATION ADDRESS
740
FORWARD THE PACKET ACCORDING TO THE RESULT OF THE SEARCH
DISCARD THE PACKET
745
750
END

FIG. 7A

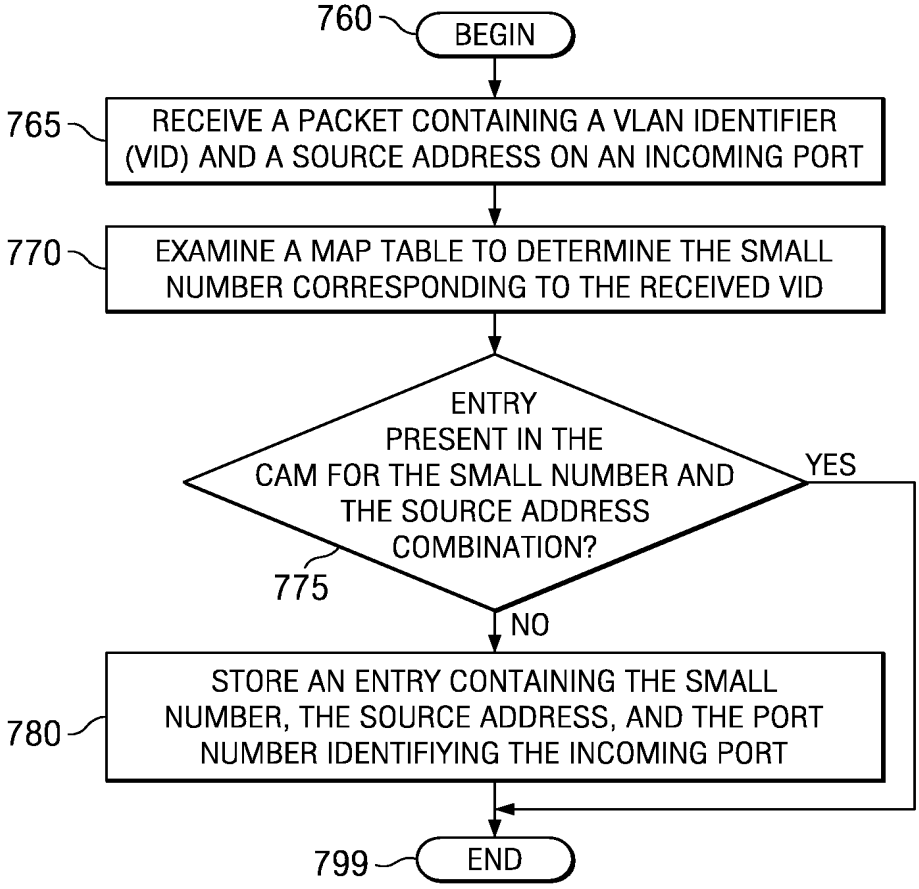


FIG. 7B

1000

	SMALL NUMBER	MAC ADDRESS	PORT NUMBER	STATIC BIT	PRIORITY
1010	-	A	1	-	-
1050	-	B	2	-	-

FIG. 10

1100

	SMALL NUMBER	MAC ADDRESS	PORT NUMBER	STATIC BIT	PRIORITY
1110	-	A	2	-	-
1150	-	B	1	-	-

FIG. 11

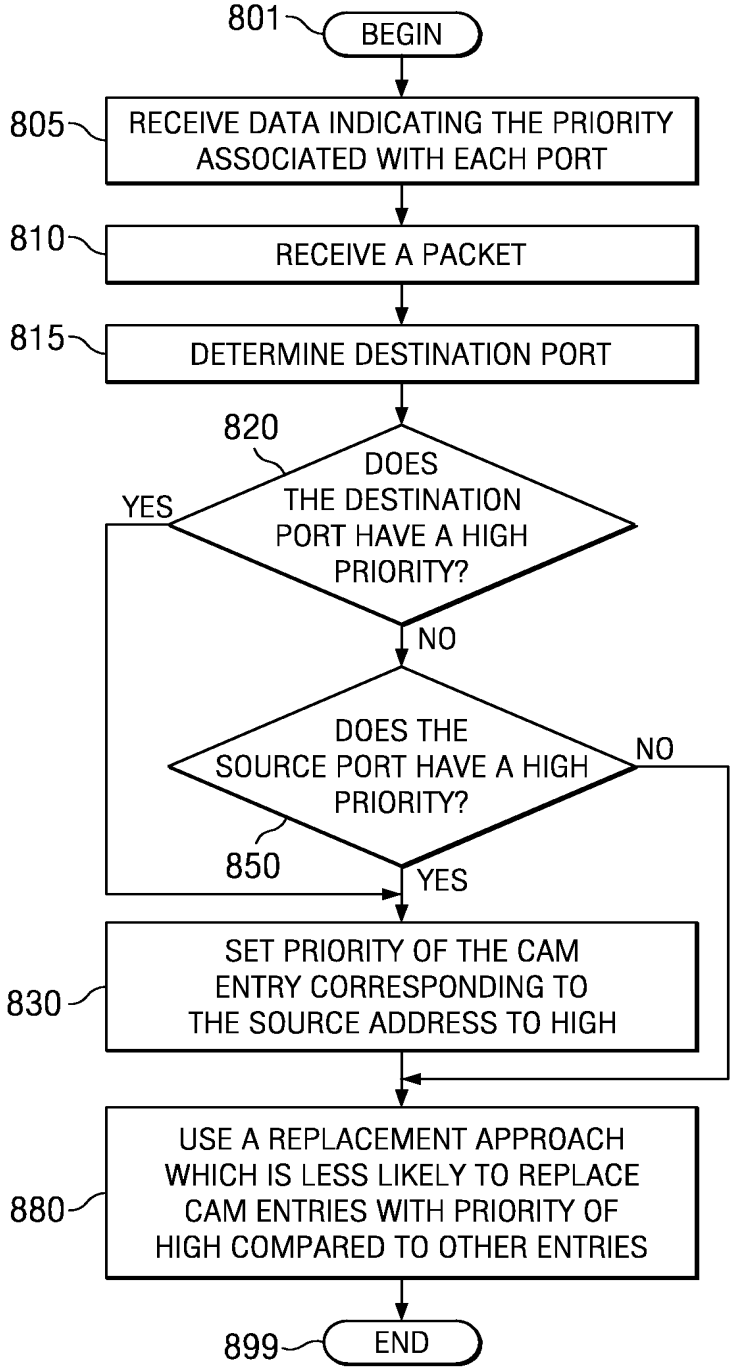

801
BEGIN
805
RECEIVE DATA INDICATING THE PRIORITY ASSOCIATED WITH EACH PORT
810
RECEIVE A PACKET
815
DETERMINE DESTINATION PORT
820
DOES THE DESTINATION PORT HAVE A HIGH PRIORITY?
YES
NO
DOES THE SOURCE PORT HAVE A HIGH PRIORITY?
NO
850
YES
SET PRIORITY OF THE CAM ENTRY CORRESPONDING TO THE SOURCE ADDRESS TO HIGH
830
USE A REPLACEMENT APPROACH WHICH IS LESS LIKELY TO REPLACE CAM ENTRIES WITH PRIORITY OF HIGH COMPARED TO OTHER ENTRIES
880
899
END

FIG. 8

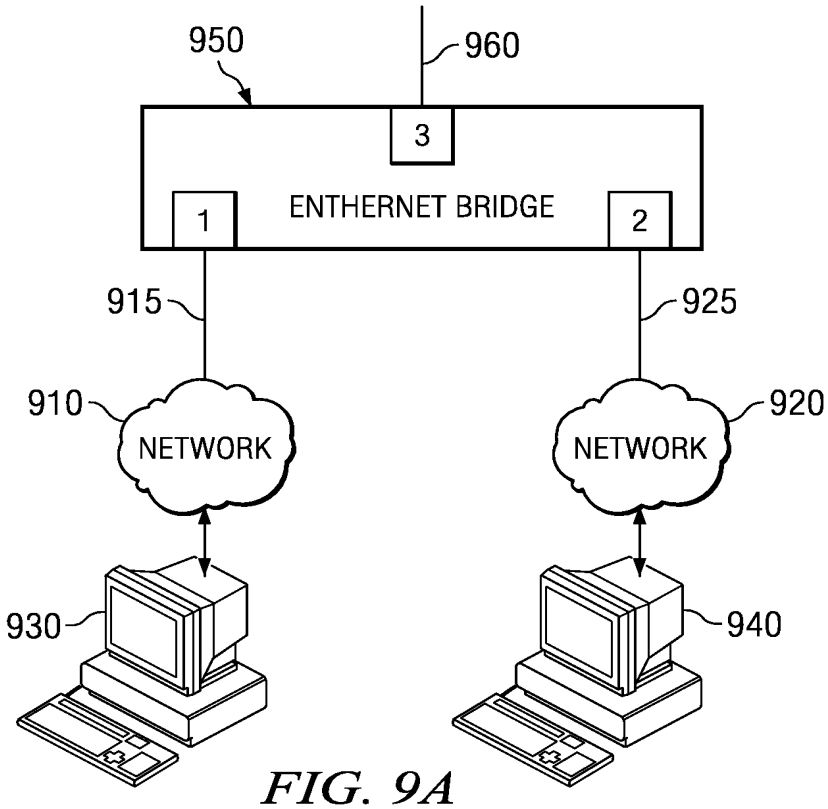

950
960
3
ENTHERNET BRIDGE
1
2
915
925
910
NETWORK
NETWORK
920
930
940

FIG. 9A

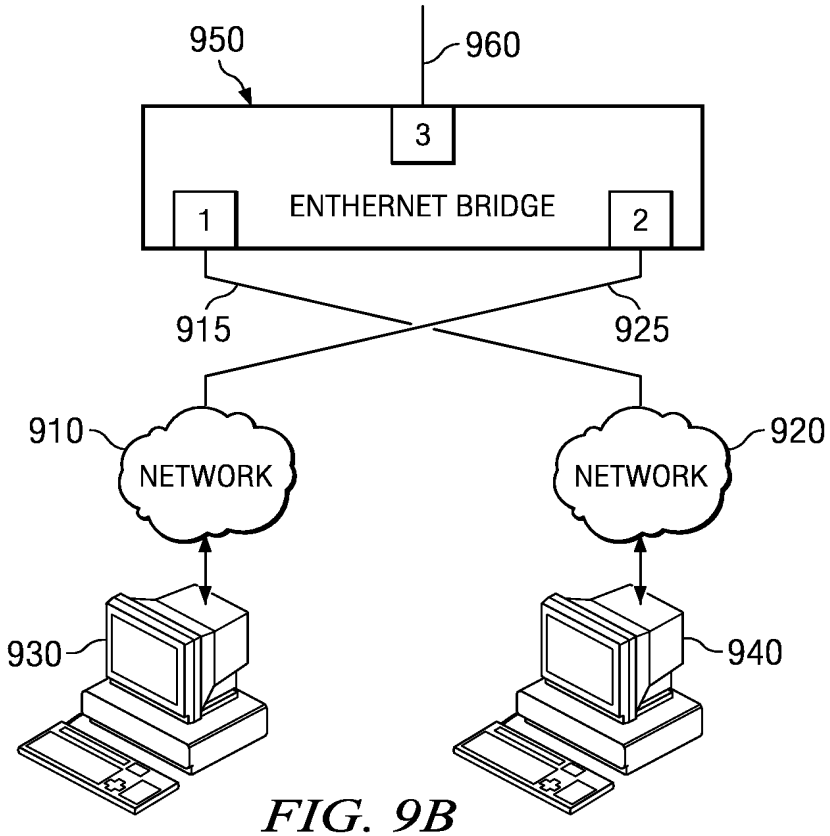

950
960
3
ENTHERNET BRIDGE
1
2
915
925
910
NETWORK
NETWORK
920
930
940

FIG. 9B

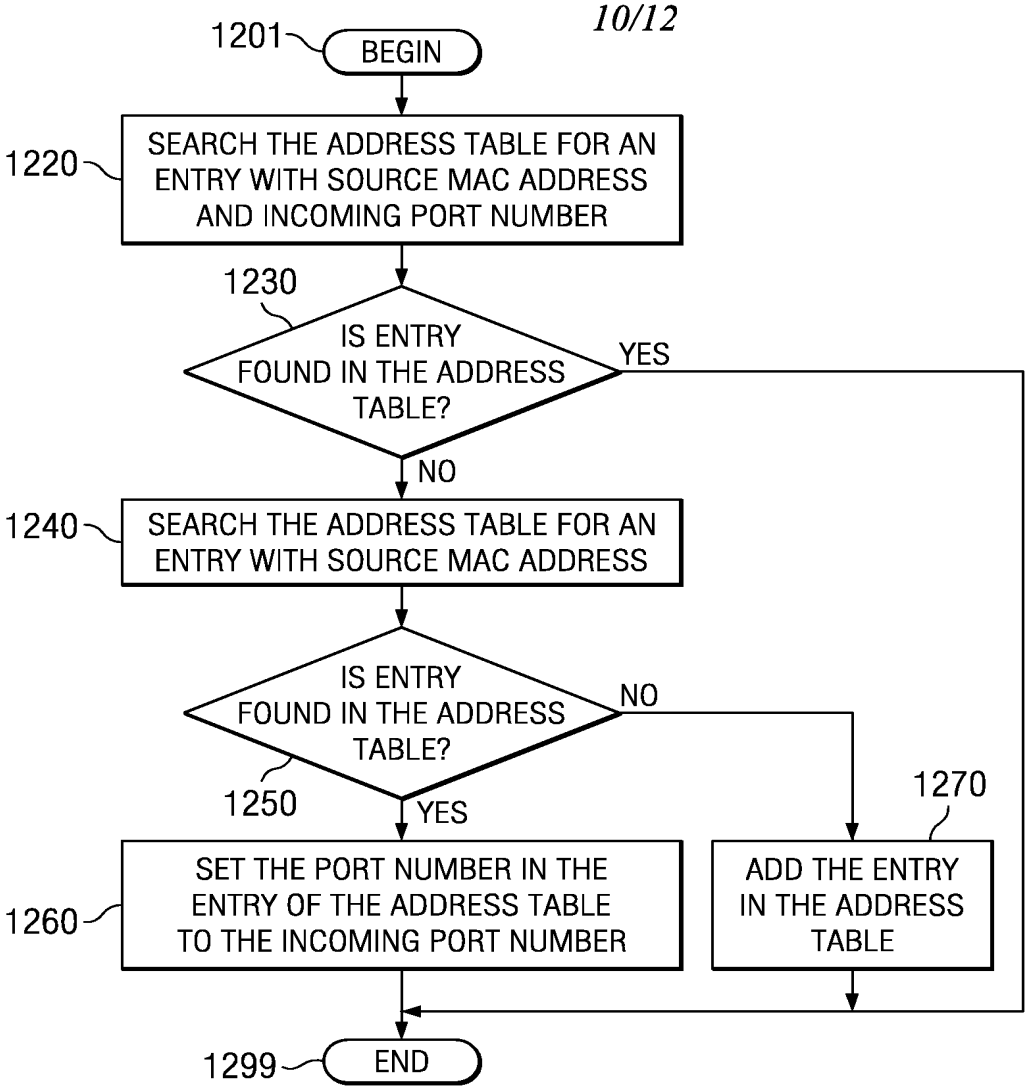

1201
BEGIN
1220
SEARCH THE ADDRESS TABLE FOR AN ENTRY WITH SOURCE MAC ADDRESS AND INCOMING PORT NUMBER
1230
IS ENTRY FOUND IN THE ADDRESS TABLE?
YES
NO
1240
SEARCH THE ADDRESS TABLE FOR AN ENTRY WITH SOURCE MAC ADDRESS
IS ENTRY FOUND IN THE ADDRESS TABLE?
NO
1250
YES
1270
1260
SET THE PORT NUMBER IN THE ENTRY OF THE ADDRESS TABLE TO THE INCOMING PORT NUMBER
ADD THE ENTRY IN THE ADDRESS TABLE
1299
END

FIG. 12

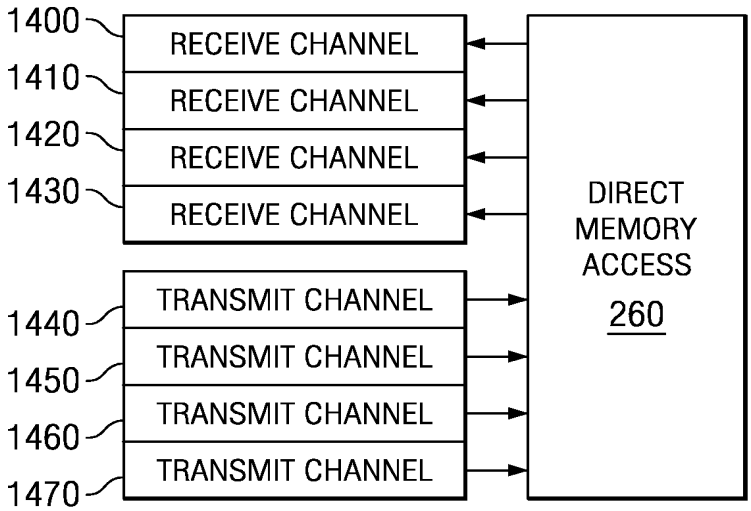

1400
RECEIVE CHANNEL
1410
RECEIVE CHANNEL
1420
RECEIVE CHANNEL
1430
RECEIVE CHANNEL
1440
TRANSMIT CHANNEL
1450
TRANSMIT CHANNEL
1460
TRANSMIT CHANNEL
1470
TRANSMIT CHANNEL
DIRECT MEMORY ACCESS
260

FIG. 14

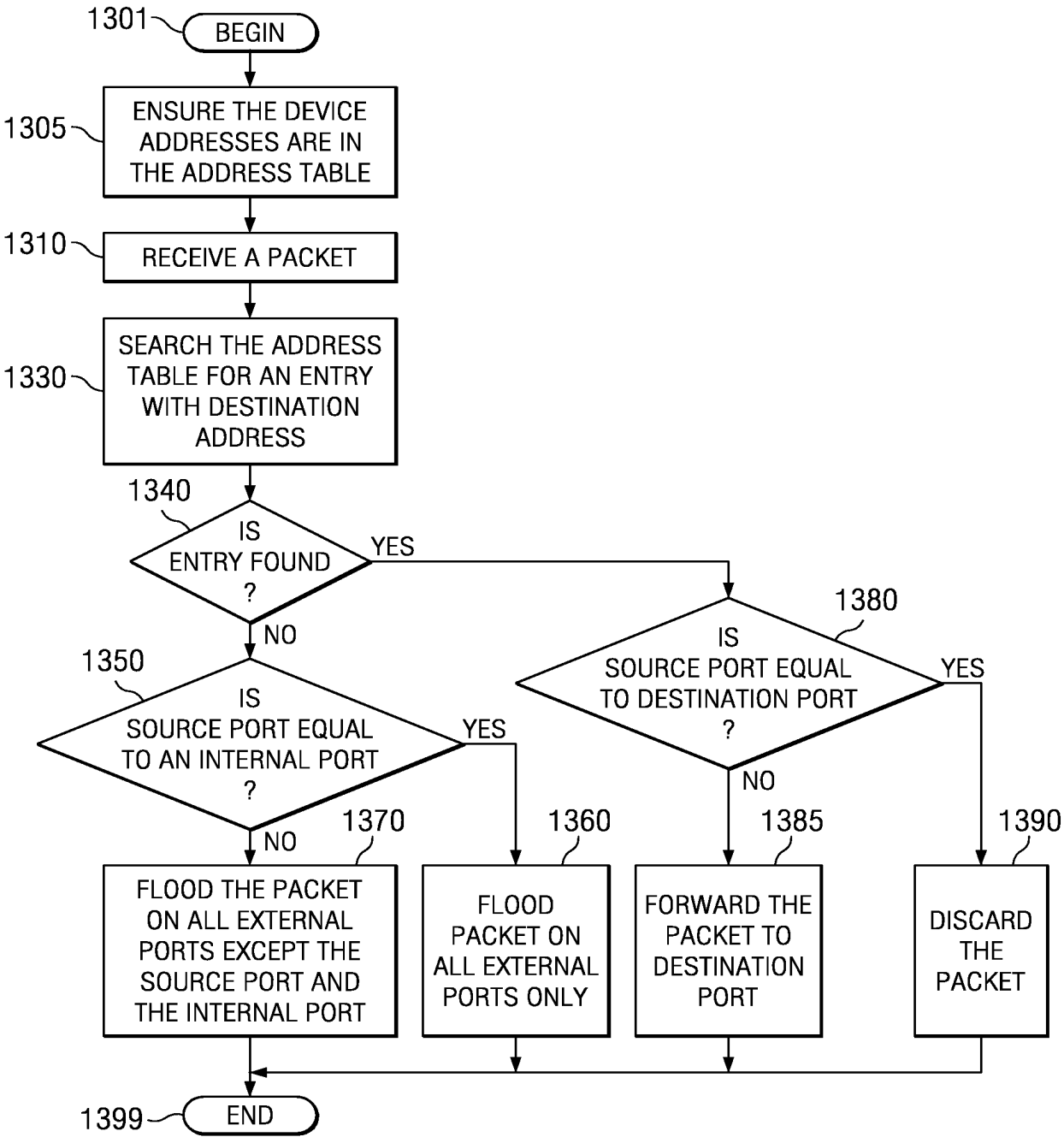

1301
BEGIN
1305
ENSURE THE DEVICE ADDRESSES ARE IN THE ADDRESS TABLE
1310
RECEIVE A PACKET
1330
SEARCH THE ADDRESS TABLE FOR AN ENTRY WITH DESTINATION ADDRESS
1340
IS ENTRY FOUND ?
YES
NO
1380
IS SOURCE PORT EQUAL TO DESTINATION PORT ?
YES
NO
1350
IS SOURCE PORT EQUAL TO AN INTERNAL PORT ?
YES
NO
1370
FLOOD THE PACKET ON ALL EXTERNAL PORTS EXCEPT THE SOURCE PORT AND THE INTERNAL PORT
1360
FLOOD PACKET ON ALL EXTERNAL PORTS ONLY
1385
FORWARD THE PACKET TO DESTINATION PORT
1390
DISCARD THE PACKET
1399
END

FIG. 13

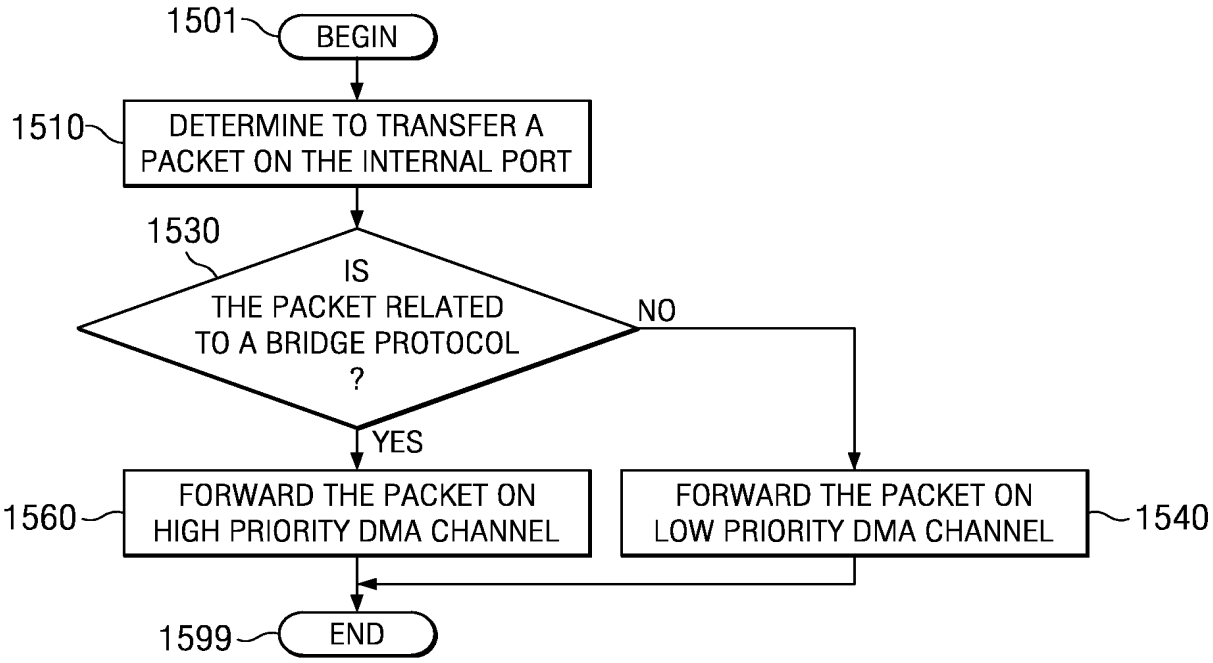

1501
BEGIN
1510
DETERMINE TO TRANSFER A PACKET ON THE INTERNAL PORT
1530
IS THE PACKET RELATED TO A BRIDGE PROTOCOL ?
NO
YES
1560
FORWARD THE PACKET ON HIGH PRIORITY DMA CHANNEL
FORWARD THE PACKET ON LOW PRIORITY DMA CHANNEL
1540
1599
END

FIG. 15

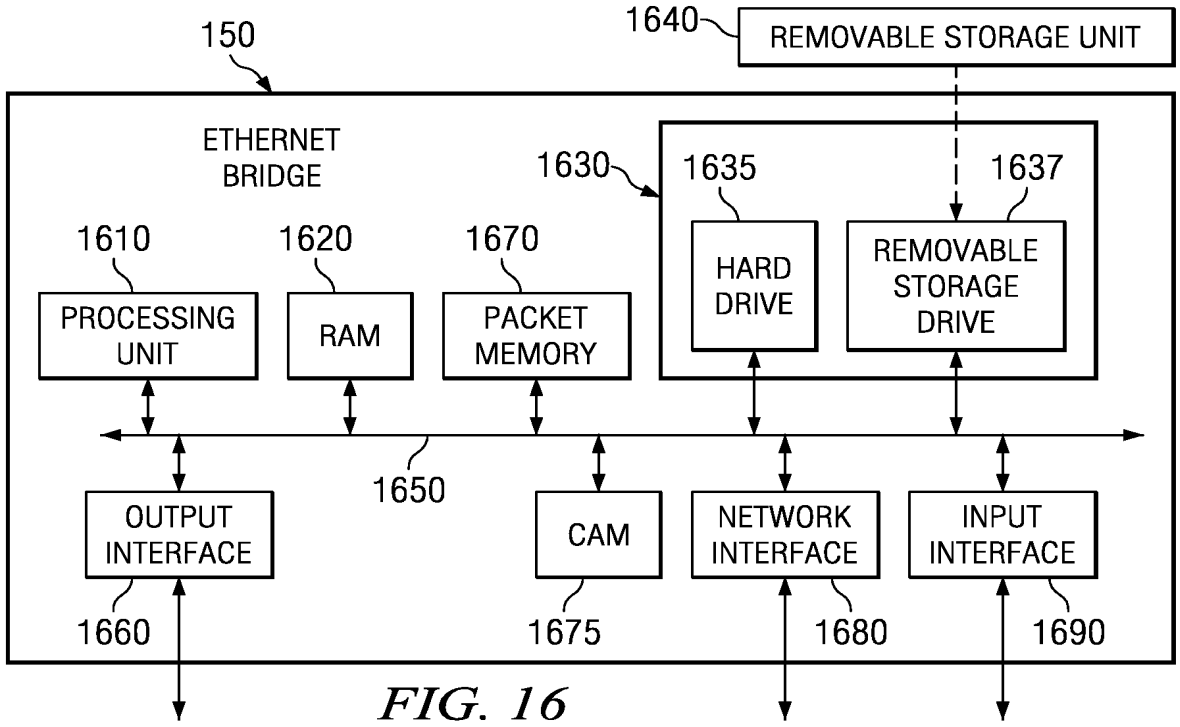

150
1640
REMOVABLE STORAGE UNIT
ETHERNET BRIDGE
1630
1635
1637
1610
1620
1670
HARD DRIVE
REMOVABLE STORAGE DRIVE
PROCESSING UNIT
RAM
PACKET MEMORY
1650
OUTPUT INTERFACE
CAM
NETWORK INTERFACE
INPUT INTERFACE
1660
1675
1680
1690

FIG. 16